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Neophyte Experiences of Football Match Analysis: A Multiple Case Study Approach

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Neophyte Experiences of Football Match Analysis: A Multiple Case Study Approach

Performance analysis is extensively used in sport, but little is understood about its pedagogical application. Given its expanding role across football, this study explored the experiences of neophyte performance analysts. Squads across three professional football clubs were investigated as multiple cases of new match analysis. Six analysis interns were interviewed about their experiences after their first season, with archival data providing background information. Four themes emerged: (1) 'building of relationships' was important, along with established trust and role clarity; (2) 'establishing an analysis system' was difficult due to tacit coach knowledge, but analysis was established; (3) the quality of the 'feedback process' hinged on coaching styles, with balance of feedback and athlete engagement considered essential; (4) 'establishing effect' was complex with no statistical effects reported; yet enhanced relationships, role clarity, and improved performances were reported. Further investigations from coach and athlete perspectives are required.

Keywords: *match analysis, analyst perceptions, video feedback, coach-athlete relationships, case study*.

Introduction

Performance analysis is well-established within elite sport (Wright et al., 2013), and challenges subjective observations of sport performance. Coaches directly benefit from performance analysis as they have difficulty observing, remembering and accurately recalling performances due to the complexity of observation (Laird & Waters, 2008). Through systematic and objective notation, performance analysis generates accurate and

reliable performance information (Hughes & Bartlett, 2015). Notational methods are therefore used to ensure feedback accuracy; with accuracy essential for athlete learning to be optimised (Maslovat & Franks, 2015). Whilst performance analysis research is plentiful (e.g. Mackenzie & Cushion, 2013), most has focused on analysis methods (e.g. Lorains et al., 2013) or outputs (e.g. Liu et al., 2016). However, due to the individuals involved and their cognitive processes (Jones, 2009; Martindale & Collins, 2010), coaching is complex (Cushion, 2007), with interrelated factors such as role, interaction, and power (Jones et al., 2002). Therefore, as performance analysis sits within coaching, researchers are now acknowledging its complexity and are discussing its pedagogical application (Groom et al., 2011; Nelson & Groom, 2011).

There is initial agreement that pedagogical, cultural, and individual factors are all important in performance analysis (Bampouras et al., 2012; Reeves & Roberts, 2013; Wright et al., 2012). More specifically, the learning environment, the social setting, relationships and motivation, have all influenced application. For example, the health of the coach-athlete relationship, and more precisely trust, can greatly affect athlete acceptance of performance analysis (Nelson et al., 2014). Similarly, coaches act politically with a range of motivations (Potrac & Jones, 2009). For example, analysis has been used to assert power, and this can negatively affect athlete perceptions, relationships and club culture if managed incorrectly (Booroff et al., 2016). Whilst technological development has been positive in facilitating growth in performance analysis (James, 2006); reliance on technology can be perceived negatively if coupled with a coach-centred culture (Williams & Manley, 2014). Despite these negatives, there are benefits when a positive coaching environment is created. For instance, netballers found analysis to be motivational when integrated into coaching (Jenkins et al., 2007). Additionally, elite rugby players wanted more analysis (Francis & Jones, 2014),

suggesting that they embraced its worth. Although few of these studies indicated the experience of participants, this distinction is important as it can influence research transferability.

As the study of expertise can be highly effective in sharing applied knowledge (Fifer et al., 2008), experiential and peer learning in coaching is common (Erickson et al., 2008); therefore, studies that provide expert perspectives should be encouraged. Subsequently, expertise research provides an understanding of fundamental professional attributes (Côté & Gilbert, 2009). Relatedly, practical accounts of analysis from experienced coaches, analysts and players should promote vicarious modelling in less experienced practitioners (Groom et al., 2011). As it can take ten years or more for expertise to be achieved (Côté & Gilbert, 2009; Nash & Collins, 2006), expert accounts may not be transferable enough to guide neophyte analysts during their training.

Despite extensive application of performance analysis (Wright et al., 2014), nobody has investigated experiences of neophyte practitioners; but, this has been investigated across other related professions. In physical education, the transition from trainee teacher affects practitioner independence and capability (Shoval et al., 2010). In sport psychology, knowledge of early professional development and conflicts is helpful for interns, supervisors, and educators (Tod et al., 2009). In sport coaching, coach development is influenced by context (Lemyre et al., 2007). Therefore, the aim of this study is to explore the experiences of performance (match) analysis interns across multiple cases in professional football.

Methods

A multiple-case study design was applied, involving in-depth investigation within and across a small number of football squads (Ashley, 2012). Each case was initially explored followed by comparisons of similarities and differences between cases (Willig, 2013). In addressing theoretical drive (Morse et al., 2006), an inductive approach was taken to this study.

Within Scottish football, rigorous application of match analysis is deemed infrequent. Therefore, to ensure rich analysis, cases and participants were purposefully sampled (Hastie & Hay, 2012). Prior to data collection, institutional ethical approval was granted. Under-17 and Under-20 squads at three Scottish professional football clubs formed the cases. Each club had recruited analysis interns from a local University to facilitate match analysis development (n = 10). These analysts had completed a performance analysis module and research project supervised by the first author, and were recruited via informed consent. Analysts also had one season's experience of match analysis within professional football and an honours degree in Sport Coaching. Experiences included filming matches, completing match analysis, supporting coaches and athletes, and facilitating feedback. These experiences afforded the analysts in-depth understanding of their case. Furthermore, their degree gave them an in-depth appreciation of match analysis.

Data collection involved one-to-one semi-structured interviews between the first author and the analysts. Semi-structured interviews maintained the boundaries of interest, but also permitted participants to fully discuss their experiences and opinions (Willig, 2013). Archival data consisting of analyst coursework revealed applications unique to each squad, and thus informed the interviews. Data included video reflections, notational data, and research projects. Participants were interviewed once for

approximately one hour, with several days between participants. This promoted reflexivity, ensuring that dialogue was co-constructed and not directed by bias (Hastie & Hay, 2012). A broad interview guide was used with questions focused on coaching and analysis background; understanding of analysis and coaching; working with players and coaching staff; utilisation of analysis; impact of analysis; and analyst experiences and opinions. In asking for detailed examples and explanations there was a focus on moving beyond capturing 'what' they did and 'how' they did it. By asking 'why' we gained a fuller understanding of each case (Martindale & Collins, 2010). Data saturation was reached after 6 participants and 7 hours of interviews; so at this point data collection was concluded (Fusch, 2015).

Data analysis proceeded simultaneously with data collection, using constant comparative analysis (Holt et al., 2012). This involved regular and systematic shifting between data collection, coding, and analysis, with in-depth comparison of similarities and differences in the data. This promoted the generation of theory that was integrated and close to the data. Braun and Clarke's (2006) six progressive steps of thematic analysis, barring transcription, were utilised to generate themes for discussion. Transcription is not a clerical task, but a method to increasing familiarity and determine meaning, therefore an alternative process was employed (Halcomb & Davidson, 2006). Initial notetaking and reflection was followed by a cycle of listening to interviews, reviewing and updating notes, and the generation of themes. Notetaking involved interpretation not recording of participant responses; and match analysis software was used to tag audio sections for review (Longomatch, Version 1.3.1, Spain, 2016).

To ensure research quality, trustworthiness and its four subcategories were employed (Shenton, 2004). Researcher familiarity with the culture under investigation, iterative questioning, triangulation, and peer review ensures credibility. Thick

description of context facilitates transferability. The research design, methods, and analysis used demonstrates dependability. Confirmability was recognised through reflexivity, an audit trail, and participant member-checking (Shenton, 2004). However, the ultimate judgement of trustworthiness comes from the study's readership (Rolfe, 2006).

Results and Discussion

From the thematic review, four themes were identified as central to the experiences of the analysts. These outline the analysts' typical journey in creating new analysis with their respective squads: (1) 'building of relationships', (2) 'establishing an analysis system', (3) 'feedback process', and (4) 'establishing effect'.

Building relationships

Building relationships with coaches was vital in successfully establishing analysis; with sub-themes identified as 'trust and rapport', and 'role clarity'.

Trust and rapport

Analysts suggested that building trust and rapport with coaches was essential (Reade et al., 2008), especially given power relationships within clubs (Potrac et al., 2006):

> *"100% you have to get the coaches onside, because if you don't you're knackered, they'll get you out the club, I've seen it happen."*

The importance of this relationship is outlined previously from coach and analyst perspectives (Wright et al., 2012; Wright et al., 2013). Coaches act as gatekeepers to notational analysis (Bampouras et al., 2012) and players can adopt a well-respected coach's view unconsciously (Nelson et al., 2014). Subsequently analysts believed that relationships with coaches would constrain all aspects of their new role:

> *"Coaches need to trust you to take on board what you're saying, what you've shown, to then relay it to players."*

Analysts reported that *"it took a while to create relationships"* and that coaches were initially *"guarded"*, citing this as *"maybe a respect thing"* or it being about "*understanding what we're bringing to the table"*. To build trust and rapport, analysts used a range of tactics to demonstrate commitment and competence, factors also important in coach-athlete relationships (Mageau & Vallerand, 2003). Tactics included observing training sessions; travelling to away matches; completing analysis work quickly; and demonstrating sport specific knowledge. Informal opportunities to talk also helped to build initial relationships with coaches (Reade et al., 2008):

> *"It took them a month to learn my name … eventually we ended up talking about normal stuff, social stuff, and from then it was 'see how we do this, do you think we should do it like that?' … it took a while."*

Forming these bonds ensured coaches were willing to share their beliefs, with this knowledge essential in developing analysis. Whilst analysts were afforded access to coach-athlete interaction, most of them had little contact with the players independently. This was not due to distrust, instead it was explainable through role clarity (Jones &

Wallace, 2005) with team feedback from match analysis controlled by the coach. An exception was through individual player analysis.

Role clarity

Role clarity is necessary for role satisfaction (Beauchamp et al., 2005) and success (Bray & Brawley, 2002), so awareness of roles within a team is essential (Fletcher & Arnold, 2011). Subsequently, coach and analyst required role clarity to foster effective communication. Initially, there was role ambiguity with analysts finding it difficult to establish information essential to their role. Analysts enquired about preferred playing style and key priorities, but received general answers such as *"goals, chances and set plays"*. This perhaps demonstrates that coaching know-how was tacit (Nash & Collins, 2006) and therefore difficult to verbalise (Lyle, 2003). Most of the coaches were new to analysis so *"as players they'd used it (a lot), but not as coaches"*. Indeed, one set of analysts experienced the following:

> *"It was the first week and we asked what the coach wanted tagged … 'well you're the experts' … 'go and pick out the key bits' … so to start with they weren't sure how to use it."*

As coaches were unable to verbalise the nuances of their preferred playing style, analysts used observation to understand philosophy and common language; for example, in team talks. However, coach appreciation of, and comfort with analysis improved. Subsequently, coaches asked for specific analysis to be added, like *"striker movement in behind"*. Yet, agreement of operational definitions was challenging as *"some of the debates would get quite heated"*. Nevertheless, clarity was necessary to improve communication and establish analysis system reliability.

Meanwhile, initial analyst freedom contradicted the power relations evident across the clubs, *"it is that strict, the gaffer's the gaffer"*. The responsibility to shape the analysis information was in stark contrast to role clarification recalled, *"the analyst needs to remember he's the analyst and not the coach"*. Other warnings of knowing your place in the organisation's micro-politics (Thompson et al., 2015) were shared:

> *"That was a warning … don't follow up with another question … it was the way he said it … it was a nice warning … you weren't embarrassed by it … but if you say something else he would probably just rip you."*

Two interns had prior experience of professional football as a player and referee, helping them negotiate their roles. In contrast, the others were initially unprepared for the environment:

> *"The personality of the coaches took me back … their egos, I wasn't prepared for it."*

Otherwise, there was ongoing frustration around the understanding of the analysts' capabilities, *"they thought we were (primarily) whiz-kids with computers"*. This misconception highlights the value coaches placed on technological support. However, as technology constrains performance analysis (James, 2006), analysts must be competent with technology (Wright et al., 2013). However, as coaching graduates they felt they could inform pedagogical application. Some coaches embraced this, but others did not, reaffirming the importance of role clarity and power relationships.

Establishing an analysis system

Given the newness of analysis at each club, the analysts played a significant part in shaping the system. Subsequently, 'team analysis' and 'individual analysis' were identified as sub-themes.

Team analysis

Initially analysts developed simple team analysis around goals, goal scoring opportunities, and set plays. This analysis focused on their own team as accessing opposition footage was difficult. Analysts were grateful to start with simple systems because of pressures such as live tagging, using keyboard shortcuts, refining filming, and ensuring accuracy:

> *"I had never done it before … it was a great opportunity … it was scary … once we got into it more … it helped."*

With experience, analysts became aware that their initial system could be enhanced, *"they (analysis variables) were so basic and broad, they (coaches and athletes) weren't able to learn that greatly from it".* Subsequently, analyst attempted to develop their performance indicators, concentrating on possession. New performance indicators included goalkeeper distribution (e.g. build and long), crosses into the box, and final 1/3 entries; with success typically defined by ball retention. The number of passes before the ball was regained, team shape, and back four distances when defending were also notated. This demonstrates progression in analyst-coach relationships and increasing analysis know-how.

Similar informal adaptation to analysis systems have been reported previously (Wright et al., 2013). This shifting focus demonstrates the short-term approach to

analysis with match highlights and statistics viewed in isolation. Comparison to previous matches was done subjectively from memory, therefore analysis was seemingly under-utilised. Yet, there are several legitimate reasons for this approach. Part-time coaches made detailed review of analysis challenging, with coaches focusing on critical incidents (Cropley et al., 2012) in the limited time available. Indeed, one club extensively used miscellaneous events at the analyst's discretion, highlighting positive clips based on negative feedback given the previous week. The aim was to give positive reinforcement, counteract public criticism, and encourage athlete persistence. Therefore, the use of analysis is complex and highly nuanced:

> *"I felt sorry for a player … it was only once he let that man slip (past him) … twice the coach said in front of everybody … 'you need to do this' … so I gave it a tag to show he has done it … the player was like 'I've tried!'."*

Individual analysis

Whilst sub-unit analysis was not used, individual analysis was. One club let players access individual clips on a pen drive, derived from team analysis. This is adjudged good practice, as athlete autonomy (Ryan & Deci, 2000) and self-controlled feedback (Chiviacowsky & Wulf, 2005) can positively influence athlete learning. Additionally, two clubs selected players politically *"that could progress to the first team… that would buy into it"*. This was similar to the approach taken at another professional club with team analysis and training focussed on key individuals (Booroff et al., 2016). Conversely, across this study, individual analysis was optional with self-directed individual training facilitated. One club hoped that by offering this to a few players it might encourage others to ask for similar support:

"There's so much scope to go much more in-depth, to look at individual stuff. If you were to do that for every player I don't have any doubts that each player would see an improvement."

Prior to individual analysis, performance indicators were selected through coach and athlete consultation. Analysts sent players video and statistical feedback electronically to facilitate reflection (Carson, 2008). Athletes were also encouraged to discuss their feedback with the analyst. Each analysis was basic to start, but player engagement with the process saw requests for more detailed information

"can you get more clips? … can you break it down into sections? … passes, tackles? … then (sub)sections even further?"

Examples of analysis included: saves by shot type and area for a goalkeeper, and individual battles and headers for a full-back. Given their exposure to athlete-centred approaches (Hendry & Hodges, 2013), analysts shared ownership of individual analysis with players, in contrast to the typically coach-centred team analysis.

Feedback process

Within the feedback process there were three sub-themes identified: 'balance of feedback', 'athlete engagement', and 'delivery particulars'.

Balance of feedback

Most athletes prefer positively weighted feedback (Høigaard et al., 2008), and relatedly a mastery environment (Pensgaard & Roberts, 2002). However, feedback should be legitimate if athletes are to have respect for and confidence in their coach's analysis

(Nelson et al., 2014). Across the squads, one coach was particularly positive when giving team feedback from match analysis, with others focused on error correction. The particularly positive coach had greater experience in utilising analysis, and had a full-time analyst paying attention to application across the youth academy; perhaps influencing the environment created:

> *"Feedback (match analysis review with the U17s coach) was a lot more positive (in comparison to U20s and the first team) … he wants to make sure he doesn't dent their confidence … his was more constructive … he tried to sympathise with them."*

In contrast, bias towards finding fault is unsurprising given the significant role coaches play in athlete development, and the political and pressured nature of professional football (Booroff et al., 2016). At the club perceived to be most negative, there was a dichotomy between the youth coaches and their publically critical supervisors:

> *"'too many of you guys are going into a tackle and you're not brave enough', he pointed out (around the room) … 'he's got it, he's not got it, you've got it, you're brave enough, he's not brave enough'."*

> *"A supervisor said to a player 'that's because you don't have the intelligence' … 'that's not me being cheeky, I'm just being honest'."*

This misuse of analysis is echoed across other performance contexts (Bampouras et al., 2012; Taylor et al., 2015; Williams & Manley, 2014), with success worryingly

attributed to inherent traits (Rees et al., 2005). Supervisor body language was also noted as being aggressive, with similar communication perceived unfavourably by athletes (Kassing & Infante, 1999):

> *"We won 4-0 … a coaching supervisor said, 'alright boys, ready for this?' (match analysis feedback) … and all the players went 'uhh!', moaning."*

Conversely, the youth coaches still active as players, although highlighting errors, attempted to use analysis feedback as a positive educational tool; highlighting development opportunities. This approach, informed by personal playing experiences, appeared to be well received, but player opinion was not sought directly:

> *"The coach said, 'I'd rather help them than stand and slaughter them' … he's good at turning it so they're learning it without making it a negative."*

The balance of feedback was generally improved as coach experience grew, highlighting coach awareness. Additionally, it is understood that we remember highlights from performances (Hughes & Bartlett, 2015), which would include significant mistakes. Subsequently, it could be unhelpful to address such errors during team analysis feedback; where extrinsic feedback from the coach would only recap the athlete's intrinsic self-assessment (Wrisberg, 2007):

> *"I said to the coaches (about showing) sending offs … what do you want me to do? … 'don't put it in, we don't need to make him feel any worse' … I think then they recognised the psychological effect."*

Likewise, positivity in match analysis feedback was reported as being dependent upon playing position. This was particularly true at the club with the most simplistic of performance indicators, centred around goals. Yet, coaches should provide balanced feedback for all playing positions to optimise learning:

> *"Defenders mostly saw mistakes … the attackers … would get a shot away … getting a pat on the back … midfield didn't get much."*

Athlete engagement

Athlete-centred coaching is engaging for athletes (Hendry & Hodges, 2013), yet the typical approach within UK football is coach-centred (Cushion et al., 2012). Analysis feedback sessions were classroom based with most coaches controlling in their feedback; but they were perhaps unaware of their behaviours (Partington et al., 2015):

> *"'what we are doing is vital (being interactive), they're having a say' (the players) … but they weren't … I tried again to have a word … but they felt that was interactive … that was the problem."*

Players were typically given a restricted voice during match analysis feedback. This frustrated the analysts, who viewed these sessions as opportunities to check understanding and build rapport. Having declarative tactical knowledge is important in the development of game intelligence (Raab, 2003), and questioning is an effective coaching tool (Williams & Hodges, 2005). Yet, questioning tended to be closed, eliciting little dialogue, and this was reflected in the imbalance seen in coach-athlete interaction:

"The coach would freeze it (the video) at points to ask them 'why', but it was 'why you not doing that?' … he wasn't actually asking them; he was just saying 'look you have done something wrong'."

"The players did speak for more (across the season), but it was still something like the coaches spoke for 27 minutes, and the athletes spoke for 1 minute and 15 seconds (referring to a session that was timed)."

However, analysts at one club stated that players were happy with the current engagement. This is in direct contrast to Francis and Jones (2014), where athletes wanted more involvement. This difference could be due to socialisation of players into typical patterns of engagement (Williams & Manley, 2014). Another reason might be a fear of engagement in a public forum, far removed from the usual pitch environment (Booroff et al., 2016). Also, having great respect for their coach can lead to blindly accepting their opinion (Nelson et al., 2014), and may be reducing interaction.

Yet, some coaches took an alternative athlete-centred approach. These coaches created a non-threatening environment, where athletes were encouraged to share their thoughts through open questioning. This approach should allow coaches to better understand player knowledge, subsequently shaping training and further analysis feedback. This interactive style also allowed coaches to immediately address points of uncertainty or misunderstanding. Athletes were considered more alert during athlete-centred analysis feedback; perhaps due to awareness of the increased athlete ownership is this interactive environment. Similar pedagogical thinking suggests active and collaborative learning should be fostered (Zepke & Leach, 2010); yet coaches

controlled the general direction of analysis feedback by selecting clips and leading sessions. Subsequently, active learning could have been taken further:

> *"It wasn't a case of 'you have done this wrong, that's poor, or that's good' … it was very open-minded, open-questioning … 'why have you done this' … they would hear what they (the athletes) had to say … 'could you have done this in the future?' … they would talk about if they'd considered that."*

Similarly, the clubs utilising individual analysis found players engaged well with the process and reflected upon performance. Having individual time with staff promoted ownership and development of performance review and goal-setting, and encouraged individual training; subsequently this approach links well with self-determination theory (Ryan & Deci, 2000). Self-controlled feedback provides autonomy; individual feedback and goal-setting instils competence; while individual time with staff builds relatedness. Therefore, these contrasting approaches to athlete engagement warrant further investigation, especially from athlete perspectives.

Delivery particulars

Other delivery particulars were essential in creating the right feedback environment. Duration of analysis feedback was a concern, with some feedback sessions lasting 45-60 minutes or more. It is believed that important messages were diluted due to the volume of information communicated (Williams & Hodges, 2005), and by excessive repetition. However, coaches acknowledged the issue and amended their practice:

> *"At the start, coaches wanted to show everything … it was so long … it was an hour with 17 year olds … I was getting bored, and it was my work."*

"Players seemed a lot more interested because it was (now) only half an hour long … at the end (of the season) the players said they actually enjoyed it (match analysis feedback)."

In contrast, other coaches kept match analysis feedback to 20-30 minutes, and the consensus was that this length of session was ideal. The timing of analysis feedback throughout the week was also well-judged, with all coaches providing feedback early in the week. This allowed this feedback to be implemented in training. Particularly, holding feedback sessions 1-2 days after performance was viewed positively:

"I think that time to digest is important … to give them time to deal with it (players and coaches)".

This delay, preferred by players (Wright et al., 2016), was deemed important for emotional control (Chan & Mallett, 2011), allowing a focused and productive review (McArdle et al., 2010). Yet, some analysts believed greater regularity of analysis feedback, held immediately before associated training, may be more useful. This would reduce the volume of information given at once, and enable it to be immediately applied. Therefore, problems with information processing and memory could be reduced (Laird & Waters, 2008).

Athletes having restricted access to footage and distance from analysis processes, although common (Bampouras et al., 2012), was considered a limitation. In contrast, players individually analysed were given their own clips, but not the entire match. Therefore, some analysts suggested that increased access via widely available

file-sharing technology, would increase acceptance of, and commitment to the analysis process. However, coaches were reportedly resistant, perhaps due to autocratic preferences or because of their unfamiliarity with such technology:

> *"The match is on the computer … 'I'm terrible with computers me, I don't know what you're talking about' (the coach responded)."*

Reluctance to utilise technology in coaching (Butryn, 2013), and more broadly within education has been reported (Howard, 2013). Therefore, coach familiarity with technology is a consideration when establishing match analysis.

Establishing effect

In establishing effect, three sub-themes were established: 'data tracking', 'player influence', and 'coach influence'.

Data tracking

Both enhancing performance and evidencing the impact of analysis are complex matters. Team success is ultimately judged by score-lines. However, ascertaining team, sub-unit and individual contributions towards success is difficult. Performance data can fluctuate greatly as it is impacted by multiple interacting variables such as form, team selection, and opposition quality (Taylor et al., 2008). Another issue is when simplistic analysis is undertaken:

> *"The stats did lie because it said they had 60% pass completion but it was all passing amongst the back four, it wasn't in the final third."*

Moreover, time restrictions limit analysis volume, therefore coach preferences are critical. Coaches preferred subjective information (video over statistics), loose analysis variables, and short-term utilisation of analysis (only reflecting match to match). This constrains the medium- to long-term tracking of performance (Wright et al., 2012) and unsurprisingly the data tracked showed few improvements. Indeed, the statistical effects of match analysis remain unclear, warranting further investigation.

Player influence

Despite frustration around the lack of statistical influence, analysts agreed other evidence of impact was apparent, like enhanced coach-athlete relationships (Mageau & Vallerand, 2003):

> *"The coach felt he had an improved relationship with the players … and the players said this was because they were speaking with their coaches a lot more."*

Furthermore, it was believed to strengthen role clarity and team cohesion (Bray & Brawley, 2002; Pain & Harwood, 2009); for example, a player reportedly commented *"the good thing is when we are playing we can keep each other right"*, so the analyst suggested "*vicarious learning had occurred"*. In satisfied coach-athlete relationships, shared knowledge and understanding is important (Jowett & Cockerill, 2003). Therefore, analysis processes may have formalised coach perceptions of performance for the athlete; and vice versa when athletes were given a voice during feedback sessions. Additionally, analysis may have facilitated greater informal communication between athlete and coach, with informal communication important in successful teams

(Reade et al., 2008). Yet perhaps the ultimate player influence, was the perceived impact of the individual analysis:

> *"None of the players were in first team consideration … seeing them get in the team was a real success … coaches felt the individual analysis had developed them … (players) wanted it to carry on because it helped."*

Coach Influence

As coaches facilitate the learning environment, any impact on the coach would be crucial. Notably, there was substantial engagement from younger coaches, proactive in seeking support:

> *"'I want to go into (full-time) management after my career, and I would definitely have this!' … he properly took it on board."*

> *"The other coaches (not getting analysis support) would say 'can you do my team this weekend?' … they all wanted a bit of it."*

Analysis also created extra training time, with pitch time limited due to athlete recovery. However, the integration of analysis into coaching took time, and there was certainly a learning curve to negotiate:

> *"From where we started … we were really bad (at using the analysis) … to where we left it was completely different."*

Whilst player interaction was not developed, perhaps due to power relationships in football (Cushion & Jones, 2006), other elements of delivery were fostered. For example, the balance of analysis feedback improved, possibly due to emotional intelligence (Chan & Mallett, 2011). Whilst coaches used analysis politically to conduct targeted training, *"the coaches changed training … using tactics to get them on the ball";* this was not at the expense of developing other players. The analysis also impacted other elements of coach decision-making, such as team tactics and training design:

> *"Something came up in the video and the coach would tell the players, 'see that, that's what we're going to work on tonight' … before the video was based on the training, but now the training was going to be based on the video."*

Now, despite these successes, some analysts were left frustrated that the use of analysis had not gone far enough, *"it's not being fully utilised … the potential's there"*. However, it is acknowledged that coaching is complex and problematic (Cushion, 2007). Consequently, any decision to extend the use of match analysis is far from simplistic. Therefore, the thought processes of coaches warrant further investigation.

Conclusion

This paper was not intended as a model of best practice nor a cautionary tale. Instead it aimed to add another authentic account to the emerging literature on the application of performance analysis. It is hoped that it provides an insight into analysis for new practitioners; that it gives experienced practitioners and educators cause for reflection;

and it encourages other researchers to share their own accounts of professional practice. It is also acknowledged that this study was limited to the perceptions of neophyte analysts, and that alternative perspectives would be valuable. Particularly, seeking in-depth accounts from other relevant stakeholders, such as coaches and athletes requires attention. Also, this study looked at a narrow group of practitioners with very similar backgrounds, from one sport. Therefore, given the contextual specificity of coaching (Lemyre et al., 2007), accounts are required from different countries, sports, and different practitioner backgrounds, to better understand the transferability of performance analysis applications.

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References

Ashley, L. D. (2012). Case study research. In Arthur, J., Waring, M., Coe, R., Hedges L.V. (Ed.), *Research Methods & Methodologies in Education.* (pp. 102-107). London: Sage.

Bampouras, T. M., Cronin, C., & Miller, P. K. (2012). Performance analytic processes in elite sport practice: An exploratory investigation of the perspectives of a sport scientist, coach and athlete. *International Journal of Performance Analysis in Sport*, 12 (2), 468-483. doi: 10.1080/24748668.2012.11868611.

Beauchamp, M. R., Bray, S. R., Eys, M. A., & Carron, A. V. (2005). Multidimensional role ambiguity and role satisfaction: A prospective examination using

interdependent sport teams. *Journal of Applied Social Psychology,* 35 (12), 2560-2576. doi:10.1111/j.1559-1816.2005.tb02114.x.

Booroff, M., Nelson, L., & Potrac, P. (2016). A coach's political use of video-based feedback: a case study in elite-level academy soccer. *Journal of Sports Sciences,* 34 (2), 116-124. doi:10.1080/02640414.2015.1039464.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology.*, 3 (2), 77-101. doi:10.1191/1478088706qp063oa.

Bray, S. R., & Brawley, L. R. (2002). Role efficacy, role clarity, and role performance effectiveness. *Small Group Research,* 33 (2), 233-253. doi:10.1177/104649640203300204.

Butryn, T. M. (2013). Body Politics: Coaching and Technology. In Potrac, P., W. Gilbert, & J. Denison (Eds.), *Routledge Handbook of Sports Coaching* (pp. 210-220). London: Routledge.

Carson, F. (2008). Utilizing Video to Facilitate Reflective Practice: Developing Sports Coaches. *International Journal of Sports Science and Coaching,* 3 (3), 381-390. doi:10.1260/174795408786238515.

Chan, J. T., & Mallett, C. J. (2011). The value of emotional intelligence for high performance coaching. *International Journal of Sport Science and Coaching,* 6 (3), 315- 326. doi:10.1260/1747-9541.6.3.315.

Chiviacowsky, S., & Wulf, G. (2005). Self-controlled feedback is effective if it is based on the learner's performance. *Research Quarterly for Exercise & Sport,* 76 (1), 42-48. doi:10.1080/02701367.2005.10599260.

Côté, J., & Gilbert, W. (2009). An Integrative Definition of Coaching Effectiveness and Expertise. *International Journal of Sports Science & Coaching,* 4 (3), 307-323. doi:10.1260/174795409789623892.

Cropley, B., Miles, A., & Peel, J. (2012). *The Value of Reflective Practice in Professional Development: An Applied Sport Psychology Review*. Leeds: Sports Coach UK.

Cushion, C. (2007). Modelling the Complexity of the Coaching Process. *International Journal of Sports Science and Coaching,* 2 (4), 395-401. doi:10.1260/174795407783359650.

Cushion, C., & Jones, R. L. (2006). Power, Discourse, and Symbolic Violence in Professional Youth Soccer: The Case of Albion Football Club. *Sociology of Sport Journal,* 23 (2), 142-161. doi:10.1123/ssj.23.2.142.

Cushion, C., Ford, P. R., & Williams, A. M. (2012). Coach behaviours and practice structures in youth soccer: Implications for talent development. *Journal of Sports Sciences,* 30 (15), 1631-1641. doi:10.1080/02640414.2012.721930.

Erickson, K., Bruner, M. W., MacDonald, D. J., & Côté, J. (2008). Gaining Insight into Actual and Preferred Sources of Coaching Knowledge. *International Journal of Sports Science & Coaching,* 3 (4), 527-538. doi:10.1260/174795408787186468.

Fifer, A., Henschen, K., Gould, D., & Ravizza, K. (2008). What Works When Working With Athletes. *Sport Psychologist,* 22 (3), 356-377. doi:10.1123/tsp.22.3.356.

Fletcher, D., & Arnold, R. (2011). A qualitative study of performance leadership and management in elite sport. *Journal of Applied Sport Psychology,* 23 (2), 223-242. doi:10.1080/10413200.2011.559184.

Francis, J., & Jones, G. (2014). Elite Rugby Union Players Perceptions of Performance Analysis. *International Journal of Performance Analysis in Sport,* 14 (1), 188-207. doi:10.1080/24748668.2014.11868714.

Fusch, P. I., Ness, L.R. (2015). Are we there yet? Data saturation in qualitative research. *The Qualitative Report,* 20 (9), 1408-1416. Retrieved from: http://nsuworks.nova.edu/tqr/vol20/iss9/3.

Groom, R., Cushion, C., & Nelson, L. J. (2011). The delivery of video-based performance analysis by England youth soccer coaches: towards a grounded theory. *Journal of Applied Sport Psychology,* 23 (1), 16-32. doi:10.1080/10413200.2010.511422.

Halcomb, E. J., & Davidson, P. M. (2006). Is verbatim transcription of interview data always necessary? *Applied Nursing Research,* 19 (1), 38-42. doi:10.1016/j.apnr.2005.06.001.

Hastie, P., & Hay, P. (2012). Qualitative approaches. In Armour, K., Macdonald, D. (Ed.), *Research Methods in Physical Education and Youth Sport.* (pp. 79-94). London: Routledge.

Hendry, D. T., & Hodges, N. J. (2013). Getting on the right track: Athlete-centred practice for expert performance in sport. In McGarry, T., O'Donoghue, P., Sampaio, J. (Ed.), *Routledge Handbook of Sports Performance Analysis.* (pp. 5-20). London: Routledge.

Høigaard, R., Jones, G. W., & Peters, D. M. (2008). Preferred coach leadership behaviour in elite soccer in relation to success and failure. *International Journal of Sports Science & Coaching,* 3 (2), 241-250. doi:10.1260/174795408785100581.

Holt, N. L., Knight, C. J., & Tamminen, K. A. (2012). Grounded Theory. In Armour, K., Macdonald, D. (Ed.), *Research Methods in Physical Education and Youth Sport.* (pp. 276-294.). London: Routledge.

Howard, S. K. (2013). Risk-aversion: Understanding teachers' resistance to technology integration. *Technology, Pedagogy and Education,* 22 (3), 357-372. doi:10.1080/1475939X.2013.802995.

Hughes, M., & Bartlett, R. (2015). What is Performance Analysis? in:. In Hughes, M., Franks, I.M. (Ed.), *Essentials of Performance Analysis on Sport.* (2nd ed., pp. 18-28). London: Routledge.

James, N. (2006). Notational analysis in soccer: past, present and future. *International Journal of Performance Analysis in Sport,* 6 (2), 67-81. doi:10.1080/24748668.2006.11868373.

Jenkins, R. E., Morgan, L., & O'Donoghue, P. (2007). A case study into the effectiveness of computerised match analysis and motivational videos within the coaching of a league netball team. *International Journal of Performance Analysis in Sport,* 7 (2), 59-80. doi:10.1080/24748668.2007.11868397.

Jones, R. L. (2009). Coaching as caring (the smiling gallery): accessing hidden knowledge. *Physical Education & Sport Pedagogy,* 14 (4), 377-390. doi:10.1080/17408980801976551.

Jones, R. L., & Wallace, M. (2005). Another bad day at the training ground: Coping with ambiguity in the coaching context. *Sport, Education and Society,* 10 (1), 119-134. doi:10.1080/1357332052000308792.

Jones, R. L., Armour, K. M., & Potrac, P. (2002). Understanding the coaching process: A framework for social analysis. *Quest,* 54 (1), 34-48. doi:10.1080/00336297.2002.10491765.

Jowett, S., & Cockerill, I. M. (2003). Olympic medallists' perspective of the athlete–coach relationship. *Psychology of Sport and Exercise,* 4 (4), 313-331. doi:10.1016/s1469-0292(02)00011-0.

Kassing, J. W., & Infante, D. A. (1999). Aggressive communication in the coach-athlete relationship. *Communication Research Reports,* 16 (2), 110-120. doi:10.1080/08824099909388708.

Laird, P., & Waters, L. (2008). Eyewitness Recollection of Sport Coaches. *International Journal of Performance Analysis in Sport,* 8 (1), 76-84. doi:10.1080/24748668.2008.11868424.

Lemyre, F., Trudel, P., & Durand-Bush, N. (2007). How youth-sport coaches learn to coach. *Sport Psychologist,* 21 (2), 191-209. doi:10.1123/tsp.21.2.191.

Liu, H., Gómez, M.-A., Gonçalves, B., & Sampaio, J. (2016). Technical performance and match-to-match variation in elite football teams. *Journal of Sports Sciences,* 34 (6), 509-518. doi:10.1080/02640414.2015.1117121.

Lorains, M., Ball, K., & MacMahon, C. (2013). Performance analysis for decision making in team sports. *International Journal of Performance Analysis in Sport,* 13 (1), 110-119. doi:10.1080/24748668.2013.11868635.

Lyle, J. (2003). Stimulated recall: A report on its use in naturalistic research. *British Educational Research Journal,* 29 (6), 861-878. doi:10.1080/0141192032000137349.

Mackenzie, R., & Cushion, C. (2013). Performance analysis in football: A critical review and implications for future research. *Journal of Sports Sciences,* 31 (6), 639-676. doi:10.1080/02640414.2012.746720.

Mageau, G. A., & Vallerand, R. J. (2003). The coach-athlete relationship: a motivational model. *Journal of Sports Sciences,* 21 (11), 883-904. doi:10.1080/0264041031000140374.

Martindale, A., & Collins, D. (2010). But Why Does What Works Work? A Response to Fifer, Henschen, Gould, and Ravizza, 2008. *Sport Psychologist,* 24 (1), 113-116. doi:10.1123/tsp.24.1.113.

Maslovat, D., & Franks, I. M. (2015). The Importance of Feedback to Performance. In Hughes, M., Franks, I.M. (Ed.), *Essentials of Performance Analysis on Sport.* (2nd ed., pp. 11-17). London: Routledge.

McArdle, S., Martin, D., Lennon, A., & Moore., P. (2010). Exploring debriefing in sports: A qualitative perspective. *Journal of Applied Sport Psychology,* 22 (3), 32--332. doi:10.1080/10413200.2010.481566.

Morse, J. M., Niehaus, L., Wolfe, R. R., & Wilkins, S. (2006). The role of the theoretical drive in maintaining validity in mixed-method research. *Qualitative Research in Psychology.,* 3, 279-291. doi:10.1177/1478088706070837.

Nash, C., & Collins, D. (2006). Tacit Knowledge in Expert Coaching: Science or Art? *Quest,* 58 (4), 465-477. doi:10.1080/00336297.2006.10491894.

Nelson, L. J., & Groom, R. (2011). The analysis of athletic performance: some practical and philosophical considerations. *Sport, Education and Society*, 1-15. doi:10.1080/13573322.2011.552574.

Nelson, L. J., Potrac, P., & Groom, R. (2014). Receiving video-based feedback in elite ice-hockey: a player's perspective. *Sport, Education and Society,* 19 (1), 19-40. doi:10.1080/13573322.2011.613925.

Pain, M., & Harwood, C. (2009). Team Building Through Mutual Sharing and Open Discussion of Team Functioning. *Sport Psychologist,* 23 (4), 523-542. doi:10.1123/tsp.23.4.523.

Partington, M., Cushion, C. J., Cope, E., & Harvey, S. (2015). The impact of video feedback on professional youth football coaches' reflection and practice behaviour: a longitudinal investigation of behaviour change. *Reflective Practice,* 16 (5), 700-716. doi:10.1080/14623943.2015.1071707.

Pensgaard, A. M., & Roberts, G. C. (2002). Elite athletes' experiences of the motivational climate: The coach matters. *Scandinavian Journal of Medicine & Science in Sports,* 12 (1), 54-59. doi:10.1034/j.1600-0838.2002.120110.x.

Potrac, P., & Jones, R. (2009). Power, Conflict, and Cooperation: Toward a Micropolitics of Coaching. *Quest,* 61 (2), 223-236. doi:10.1080/00336297.2009.10483612.

Potrac, P., Jones, R., & Cushion, C. (2006). Understanding Power and the Coach's Role in Professional English Soccer: A Preliminary Investigation of Coach Behaviour. *Soccer & Society,* 8 (1), 33-49. doi:10.1080/14660970600989509.

Raab, M. (2003). Decision making in sports: Influence of complexity on implicit and explicit learning. *International Journal of Sport and Exercise Psychology,* 1 (4), 406-433. doi:10.1080/1612197X.2003.9671728.

Reade, I., Rodgers, W., & Spriggs, K. (2008). New Ideas for High Performance Coaches: A Case Study of Knowledge Transfer in Sport Science. *International Journal of Sports Science and Coaching,* 3 (3), 335-354. doi:10.1260/174795408786238533.

Rees, T., Ingledew, D. K., & Hardy, L. (2005). Attribution in sport psychology: Seeking congruence between theory, research and practice. *Psychology of Sport and Exercise,* 6 (2). doi:10.1016/J.Psychsport.2003.10.008.

Reeves, M. J., & Roberts, S. J. (2013). Perceptions of Performance Analysis in Elite Youth Football. *International Journal of Performance Analysis in Sport,* 13 (1), 200-211. doi:10.1080/24748668.2013.11868642.

Rolfe, G. (2006). Validity, trustworthiness and rigour: quality and the idea of qualitative research. *Journal of Advanced Nursing,* 53 (3), 304-310. doi:10.1111/j.1365-2648.2006.03727.x.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist,* 55, 68-78. doi:10.1037/0003-066X.55.1.68.

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information,* 22, 63-75. doi:10.3233/EFI-2004-22201.

Shoval, E., Erlich, I., & Fejgin, N. (2010). Mapping and interpreting novice physical education teachers' self-perceptions of strengths and difficulties. *Physical Education and Sport Pedagogy,* 15 (1), 85-101. doi:10.1080/17408980902731350.

Taylor, J. B., Mellalieu, S. D., James, N., & Shearer, D. A. (2008). The influence of match location, quality of opposition, and match status on technical performance in professional association football. *Journal of Sport Sciences,* 26 (9), 885-895. doi:10.1080/02640410701836887.

Taylor, W. G., Potrac, P., Nelson, L. J., Jones, L., & Groom, R. (2015). An elite hockey player's experiences of video-based coaching: A poststructuralist reading. *International Review for the Sociology of Sport,* 1-14. doi:10.1177/1012690215576102.

Thompson, A., Potrac, P., & Jones, R. (2015). 'I found out the hard way': micro-political workings in professional football. *Sport, Education & Society,* 20 (8), 976-994. doi:10.1080/13573322.2013.862786.

Tod, D., Andersen, M. B., & Marchant, D. B. (2009). A Longitudinal Examination of Neophyte Applied Sport Psychologists' Development. *Journal of Applied Sport Psychology,* 21, 1-16. doi:10.1080/10413200802593604.

Williams, A. M., & Hodges, N. (2005). Practice, instruction and skill acquisition in soccer: Challenging tradition. *Journal of Sports Sciences,* 23 (6), 637-650. doi:10.1080/02640410400021328.

Williams, S., & Manley, A. (2014). Elite coaching and the technocratic engineer: thanking the boys at Microsoft! *Sport, Education and Society,* 1-23. doi:10.1080/13573322.2014.958816.

Willig, C. (2013). *Introducing Qualitative Research in Psychology.* (2nd ed.): Maidenhed: McGraw Hill.

Wright, C., Atkins, S., & Jones, B. (2012). An analysis of elite coaches' engagement with performance analysis services (match, notational analysis and technique analysis). *International Journal of Performance Analysis in Sport,* 12 (2), 436-451. doi:10.1080/24748668.2012.11868609.

Wright, C., Carling, C., & Collins, D. (2014). The wider context of performance analysis and it application in the football coaching process. *International Journal of Performance Analysis in Sport,* 14 (3), 709-733. doi:10.1080/24748668.2014.11868753.

Wright, C., Atkins, S., Jones, B., & Todd, J. (2013). The role of performance analysts within the coaching process: Performance Analysts Survey 'The role of performance analysts in elite football club settings.'. *International Journal of Performance Analysis in Sport,* 13 (1), 240-261. doi:10.1080/24748668.2013.11868645.

Wright, C., Carling, C., Lawlor, C., & Collins, D. (2016). Elite football player engagement with performance analysis. *International Journal of Performance Analysis in Sport,* 16 (3), 1007-1032. doi:10.1080/24748668.2016.11868945.

Wrisberg, C. (2007). *Sport Skill Instruction for Coaches*. Leeds: Human Kinetics.

Zepke, N., & Leach, L. (2010). Improving student engagement: Ten proposals for action. *Active Learning in Higher Education,* 11 (3), 167-177. doi:10.1177/1469787410379680.